

CLAIMS

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3           1.   A vehicle separable hands free unit for a  
4 mobile wireless telephone having internal audio circuitry  
5 for an internal speaker and an internal microphone, compris-  
6 ing: a base unit, a vehicle separable connector quickly  
7 connectable to the vehicle's power supply for supplying  
8 power to the base unit, said base unit including a hands  
9 free speaker and a hands free microphone, AHF control means  
10 in the base unit for commanding the telephone to disconnect  
11 the telephone's internal speaker and internal microphone and  
12 connect the internal audio circuits to the base unit and to  
13 activate the base unit hands free speaker and hands free  
14 microphone, PHF control means in the base unit for command-  
15 ing the telephone to connect the telephone's internal  
16 speaker and internal microphone to the internal audio cir-  
17 cuits and to deactivate the base unit hands free speaker and  
18 hands free microphone, and a manually operable switch in the  
19 base unit for selecting alternatively the AHF control or the  
20 PHF control.

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22           2.   A vehicle separable hands free unit for a  
23 mobile wireless telephone as defined in Claim 1, wherein the  
24 switch includes a user finger operable optical switch.

3. A vehicle separable hands free unit for a mobile wireless telephone as defined in Claim 1, wherein the AHF control means and the PHF control means are incorporated in part in a microprocessor in the base unit, said microprocessor generating and sending an ID request packet to the phone, receiving an ID packet from the phone to determine the model of telephone.

4. A vehicle separable hands free unit for a mobile wireless telephone as defined in Claim 3, said microprocessor utilizing the ID packet from the phone to identify a look-up value on a table, said microprocessor utilizing the look-up value to generate an AHF packet and send it to the telephone as part of the AHF control means.

5. A vehicle separable hands free unit for a mobile wireless telephone as defined in Claim 3, said microprocessor utilizing the ID packet from the phone to identify a look-up value in a table, said microprocessor utilizing the look-up value to generate a PHF packet and send it to the telephone as part of the PHF control means.

1           6.    A vehicle separable hands free unit for a  
2 mobile wireless telephone as defined in Claim 1, including a  
3 microprocessor in the hands free unit for requesting model  
4 number identification from the phone and utilizing that  
5 identification to develop commands to the telephone in the  
6 AHF control means and the PHF control means.

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8           7.    A vehicle separable hands free unit for a  
9 mobile wireless telephone as defined in Claim 1, said base  
10 unit including a duplexing circuit for attenuating the level  
11 of the hands free microphone at predetermined values of the  
12 telephone's internal audio circuits.

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14           8.    A vehicle separable hands free unit for a  
15 mobile wireless telephone having internal audio circuitry  
16 for an internal speaker and an internal microphone, compris-  
17 ing: a base unit, a vehicle separable connector quickly  
18 connectable to the vehicle's power supply for supplying  
19 power to the base unit, said base unit including a hands  
20 free speaker and a hands free microphone, a microprocessor  
21 in the base unit for sending an ID request packet to the  
22 telephone and receiving a phone ID packet from the phone,  
23 said microprocessor utilizing the same ID packet to generate  
24 an AHF packet to the telephone for commanding the telephone

1 to disconnect the telephone's internal speaker and internal  
2 microphone and connect the internal audio circuits to the  
3 base unit and to activate the base unit hands free speaker  
4 and hands free microphone.

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6 9. A vehicle separable hands free unit for a  
7 mobile wireless telephone as defined in Claim 8, said  
8 microprocessor utilizing the phone ID packet to generate a  
9 PHF packet to the telephone for commanding the telephone to  
10 connect the telephone's internal speaker and internal  
11 microphone to the internal audio circuits.

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13 10. A vehicle separable hands free unit for a  
14 mobile wireless telephone as defined in Claim 8, said  
15 microprocessor repeatedly sending the AHF packet to the  
16 telephone to maintain the telephone in an AHF mode when  
17 desired.

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19 11. A vehicle separable hands free unit for a  
20 mobile wireless telephone as defined in Claim 9, said  
21 microprocessor repeatedly sending the PHF packet to the  
22 telephone to maintain the telephone in a PHF mode when  
23 desired.

1           12. A vehicle separable hands free unit for a  
2 mobile wireless telephone as defined in Claim 8, said  
3 microprocessor utilizing the ID packet from the phone to  
4 identify a look-up value in a table, said microprocessor  
5 utilizing the look-up value to generate an AHF packet and  
6 send it to the telephone as part of the AHF control means.

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8           13. A vehicle separable hands free unit for a  
9 mobile wireless telephone as defined in Claim 8, said  
10 microprocessor utilizing the ID packet from the phone to  
11 identify a look-up value in a table, said microprocessor  
12 utilizing the look-up value to generate a PHF packet and  
13 send it to the telephone as part of the PHF control means.

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15           14. A vehicle separable hands free unit for a  
16 mobile wireless telephone having internal audio circuitry  
17 for an internal speaker and an internal microphone, compris-  
18 ing: a base unit, a vehicle separable connector quickly  
19 connectable to the vehicle's power supply for supplying  
20 power to the base unit, said base unit including a hands  
21 free speaker and a hands free microphone, a microprocessor  
22 in the base unit for sending an AHF packet to the telephone  
23 for commanding the telephone to disconnect the telephone's  
24 internal speaker and internal microphone and connect the in-

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1 ternal audio circuits to the base unit, and to activate the  
2 base unit hands free speaker and hands free microphone, said  
3 microprocessor repeatedly sending the AHF packet to the  
4 telephone for maintaining the telephone in an AHF mode.

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6 15. A vehicle separable hands free unit for a  
7 mobile wireless telephone as defined in Claim 14, said  
8 microprocessor sending a PHF packet to the telephone for  
9 commanding the telephone to connect the telephone's internal  
10 speaker and internal microphone to the internal audio cir-  
11 cuits, said microprocessor repeatedly sending the PHF packet  
12 to the telephone to maintain the telephone in a PHF mode.

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14 16. An aftermarket hands free unit for a mobile  
15 wireless telephone, comprising: a base unit having an in-  
16 tegral generally annular nose insertable into a vehicle  
17 power socket, said base including a housing with upper and  
18 lower housing portions, a circuit board clam shelled between  
19 the upper and lower housing portions, and a speaker clam  
20 shelled between the circuit board and the upper housing por-  
21 tion.

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1           17. An aftermarket hands free unit for a mobile  
2 wireless telephone as defined in Claim 16, wherein the upper  
3 housing portion has a grill for the speaker.

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5           18. An aftermarket hands free unit for a mobile  
6 wireless telephone as defined in Claim 16, including a  
7 finger insertable recess in the housing with a switch  
8 therein for operating the hands free unit.

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10           19. An aftermarket hands free unit for a mobile  
11 wireless telephone as defined in Claim 18, wherein the  
12 switch is an optical switch.

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14           20. An aftermarket hands free unit for a mobile  
15 wireless telephone, comprising: a base unit having an in-  
16 tegral generally annular nose insertable into a vehicle  
17 power socket, said base including a housing, a finger in-  
18 sertable recess in the housing with a switch thereon for  
19 operating the hands free unit.

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21           21. An aftermarket hands free unit for a mobile  
22 wireless telephone as defined in Claim 19, wherein the  
23 switch is an optical switch.

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1           22. A vehicle separable hands free unit for a  
2 mobile wireless telephone having internal audio circuitry  
3 for an internal speaker and an internal microphone, compris-  
4 ing: a base unit, a vehicle separable connector quickly  
5 connectable to the vehicle's power supply for supplying  
6 power to the base unit, said base unit including a hands  
7 free speaker and a hands free microphone, and a duplexing  
8 circuit in the base unit for attenuating or interrupting the  
9 hands free microphone level at a predetermined audio level  
10 of the hands free speaker.

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12           23. A vehicle separable hands free unit for a  
13 mobile wireless telephone having internal audio circuitry  
14 for an internal speaker and an internal microphone, compris-  
15 ing: a base unit, a vehicle separable connector quickly  
16 connectable to the vehicle's power supply for supplying  
17 power to the base unit, said base unit including a hands  
18 free speaker and a hands free microphone, and a circuit in  
19 the base unit permitting connection of the base unit to a  
20 phone during a call without interrupting the call.

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TELEPHONE

1           24. A vehicle separable hands free unit for a  
2 mobile wireless telephone as defined in Claim 23, including  
3 means for activating the base unit while the call is in  
4 process.

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6           25. A vehicle separable hands free unit for a  
7 mobile wireless telephone having internal audio circuitry  
8 for an internal speaker and an internal microphone, compris-  
9 ing: a base unit, a vehicle separable connector quickly  
10 connectable to the vehicle's power supply for supplying  
11 power to the base unit, said base unit including a hands  
12 free speaker and a hands free microphone, and a circuit in  
13 the base unit for reducing echo from the speaker.

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15           26. A vehicle separable hands free unit for a  
16 mobile wireless telephone as defined in Claim 25, wherein  
17 the means to reduce echo from the speaker includes click  
18 less opto resistors.

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20           27. A vehicle separable hands free unit for a  
21 mobile wireless telephone as defined in Claim 25, including  
22 means for summing inverted ground signals with audio signals  
23 to cancel noise.